28. Konety SH, Vaughan Sarrazin MS, Rosenthal GE. Patient and hospital differences underlying racial variation in outcomes after coronary artery bypass graft surgery. Circulation 2005;111:1210-6.
29. Birkmeyer JD, Siewers AE, Finlayson EV, Stukel TA, Lucas FL, Batista I, et al. Hospital volume and surgical mortality in the United States. N Engl J Med 2002;346:1128-37.
30. Holt PJ, Poloniecki JD, Loftus IM, Thompson MM. Meta-analysis and systematic review of the relationship between hospital volume and outcome following carotid endarterectomy. Eur J Vasc Endovasc Surg 2007;33:645-51.
31. Holt PJ, Poloniecki JD, Gerrard D, Loftus IM, Thompson MM. Meta-analysis and systematic review of the relationship between volume and outcome in abdominal aortic aneurysm surgery. Br J Surg 2007; 94:395-403.
32. Killeen SD, Andrews EJ, Redmond HP, Fulton GJ. Provider volume and outcomes for abdominal aortic aneurysm repair, carotid endarterectomy, and lower extremity revascularization procedures. J Vasc Surg 2007;45:615-26.
33. Ebaugh JL, Feinglass J, Pearce WH. The effect of hospital vascular operation capability on outcomes of lower extremity arterial bypass graft procedures. Surgery 2001;130:561-7; discussion 7-9.
34. Birkmeyer JD. Understanding surgeon performance and improving patient outcomes. J Clin Oncol 2004;22:2765-6.
35. Ho V, Wirthlin D, Yun H, Allison J. Physician supply, treatment, and amputation rates for peripheral arterial disease. J Vasc Surg 2005;42: 81-7.
36. Hoel AW, Kayssi A, Brahmanandam S, Belkin M, Conte MS, Nguyen LL. Under-representation of women and ethnic minorities in vascular surgery randomized controlled trials. J Vasc Surg 2009;50:349-54.
37. McAlpine DD, Beebe TJ, Davern M, Call KT. Agreement between self-reported and administrative race and ethnicity data among Medicaid enrollees in Minnesota. Health Serv Res 2007;42(6 Pt 2): 2373-88.
38. Finlayson E, Birkmeyer JD. Research based on administrative data. Surgery. 2009;145:610-6.

Submitted Jun 21, 2010; accepted Aug 25, 2010.

Additional material for this article may be found online at www.jvascsurg.org.

DISCUSSION

Dr Joseph Ricotta (*Rochester, Minn*). I would like to congratulate Dr Henry and her colleagues for an excellent presentation and for providing us with important information on an under-investigated topic. The first question that comes to mind is what was the relationship between the socioeconomic status of the patients and the acuity of their presentation? We know that patients that present emergently do worse than patients that present and have their procedures electively, and one might infer that patients with lower socioeconomic status may delay seeking medical attention. Was this the case in your study, and do you think that influenced the outcomes?

Dr Antonia J. Henry. We did examine the relationship between socioeconomic status and the acuity of presentation. I did find that the patients with Medicaid or no insurance were more likely to present emergently or urgently. Patients who presented with ischemic gangrene were more likely to have low income.

Dr Ricotta. So, the patients with low socioeconomic status (SES) presented more acutely?

Dr Henry. Yes.

Dr Ricotta. Along the same lines, I am a little confused, because you were nice enough to give me the manuscript ahead of time, but one of the tables in your manuscript contradicts one of the tables that you presented here with regards to angiography. Was there a difference in terms of race with the number of patients that underwent angiography? Because in the manuscript there was not, but it looked to me like there was a difference on one of the slides you presented. Was there a difference in race for those patients who underwent angiography? Did the minority patients undergo angiography? And, if so, was there a statistically significant difference compared with the white patients who underwent angiography?

Dr Henry. Thank you very much for your very close reading of the manuscript. Earlier this week, I found a coding error in my program and so I reran the analyses and I did find that patients who were identified as Hispanic were at significantly decreased odds of undergoing a diagnostic angiogram, but there was no significant relationship between the other racial groups and whether or not a patient had an angiogram.

Dr Ricotta. So one might say that there is no inherent bias there, because they are undergoing an angiogram presumably with the intent to treat, but maybe on the angiogram, they have a higher propensity or higher frequency of unreconstructable disease in the minority patients. I just was interested in your comment.

Dr Henry. I think everyone remembers a very often cited paper by Dr Sidawy documenting the increased prevalence of small vessel occlusive disease in black patients compared with white patients on angiogram. Again, one of the limitations of using NIS is that we do not have the information on the anatomy that was found in the diagnostic angiogram, so that will be evaluated in our prospective study.

Dr Ricotta. Just two more questions. Native Americans were a small percentage of your patients in this study, but there was some significant data associated with them. They did poorly, yet they participate in a government-run health service. With all the changes in health care that are occurring now, I think this is an important point. Presumably, they have access to care because they participate in a government-run program. Can you comment on why they did worse?

Dr Henry. The Native American population was less than 1% of our study population. The NIS contains US community hospitals. It does not include federal hospitals. So, hospitals that may fall under the purview of the Indian Health Service are not included in this cohort, and therefore the Native Americans in NIS may not be representative of the larger IHS cohort.

Dr Ricotta. And along the same lines, can you give us any information or have any studies been done with the VA population? Because presumably, again, this is a standard of care that is offered to everybody that participates in the VA of all different kinds of races and creeds and socioeconomic status. Has anything been done to examine ethnicity in VA patients who all have equal access to care?

Dr Henry. That is a great population to look at. The incentives that private practice physicians have do not exist as strongly in the VA population. I have not read any papers looking at this specific question among VA patients, but it would be a great idea for a future research project.

Dr Hasan Dosluoglu (*Buffalo, NY*). I would like to say it is coming up, because I can tell you that we looked at this very subject in our VA population, which is yet unpublished data. What we found was the primary amputation rate was higher in African Americans – despite our aggressiveness with the limb salvage irrespective of, obviously, of race, and yet after attempted revascularization, we found that limb salvage rates were similar. And, also we found that the African Americans had more infrapopliteal disease and were more likely to be diabetic or more likely to be on insulin. Although they were a little riskier with equal access to care, they do present with advanced ischemia, which was significant, with 10% to 12% difference. But then after that, we found that the patency rates were similar, although there had been previous reports that suggested differences in patency rates. However, I have to warn that it is an all-male population, and the females may act differently because the patency rates may be worse in African American females than others.